--[0063] Figure 10 shows a borehole (41) penetrating an earth formation (42). A downhole tool (44) is lowered into the borehole (41). The downhole tool (44) may be a wireline tool or a logging or measuring-while-drilling tool. The downhole tool (44) includes a displacement measurement system of the invention. In accordance with one embodiment of the invention, a first magnetic sensor (50), a second magnetic sensor (52), and a third magnetic sensor (48) are located inside the downhole tool housing (46) and the magnetic field source (54) is placed outside the housing (46). The magnetic field source (54) is moveably attached to the housing (46) through couplings (56). Also, the magnetic field source (54) may be placed within an enclosure (58) to avoid direct contact with the downhole fluids. The magnetic field source (54) is attached to one end (62) of the arm (60), while the other end (64) of the arm (60) is attached to the housing (46). As stated above, the radius (r) of the borehole is determined through the geometric relations that exist between the radius of borehole, the curvature of the arm (60), and the magnetic field source (54) displacement. In another embodiment of the invention, the magnetic field source (54) is located inside the housing (44) and the magnetic sensors (48, 50, 52) are placed outside the housing.--

REMARKS

Figures 4a and 10 have been amended to correct minor informalities. The components B_{XA} and B_{YA} were switched in original Figure 4a. One skilled in the art would easily recognize the minor discrepancy. Figure 10 has been amended to change reference number 40 to 41 in order to avoid double use of the same reference number for two different items. No new matter is introduced by amendment. Applicant respectfully requests approval of these drawing changes.

The specification has been amended to correct a minor typographical error. Reference numeral 40 in paragraph [0036] has been changed to number 41 in accord with the proposed drawing change to Figure 10. The Examiner is invited to contact the undersigned attorney at (281) 285-4562 with any questions, comments or suggestions relating to the referenced patent application.

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